

# Is the global rise of asthma an early impact of anthropogenic climate change?

**Dr Paul John Beggs, and Dr Hilary Jane Bambrick**  
**doi:10.1289/ehp.7724 (available at <http://dx.doi.org/>)**  
**Online 20 April 2005**



**Is the global rise of asthma an early impact of anthropogenic climate change?**

Dr Paul John Beggs

Department of Physical Geography

Division of Environmental and Life Sciences

Macquarie University

New South Wales 2109

Australia

Telephone: +61 2 9850 8399

Fax: +61 2 9850 8420

E-mail: paul.beggs@mq.edu.au

Dr Hilary Jane Bambrick

National Centre for Epidemiology and Population Health

The Australian National University

Canberra

Australian Capital Territory 0200

Australia

Telephone: +61 2 6125 8595

Fax: +61 2 6125 0740

E-mail: hilary.bambrick@anu.edu.au

Corresponding author: Dr Paul John Beggs

**Running title**

Is the rise of asthma an impact of climate change?

**Acknowledgments**

A conflict of interest was not reported. Many thanks to Professor Neil Pearce for providing asthma prevalence data, and to the National Centre for Epidemiology and Population Health review group for their very helpful comments: Dr Charles Blumer, Dr Rennie D'Souza, Dr Kathryn Glass, Mr James Harris, Dr Robyn Lucas, Dr Lyndall Strazdins and Dr Rosalie Woodruff.

**Key words**

aeroallergens

anthropogenic climate change

asthma

carbon dioxide

phenology

pollen

temperature

## **Abbreviations**

CO<sub>2</sub>: carbon dioxide

DJF: December, January, February

IPCC: Intergovernmental Panel on Climate Change

ISAAC: International Study of Asthma and Allergies in Childhood

MAM: March, April, May

JJA: June, July, August

ppm: parts per million

SON: September, October, November

Th1: T helper type 1

Th2: T helper type 2

WHO: World Health Organization

## **Outline**

Abstract

Global trends in asthma

Anthropogenic climate change

Elevated CO<sub>2</sub> and climate change impacts on pollen

Impacts of climate change on asthma

Conclusions

References

Figure legends

## **Abstract**

The increase in asthma incidence, prevalence and morbidity over recent decades presents a significant challenge to public health. Pollen is an important trigger of some types of asthma and both pollen quantity and season are dependent on climatic and meteorological variables. Over the same period as the global rise in asthma there have been considerable increases in atmospheric carbon dioxide concentration and global average surface temperature. We hypothesize anthropogenic climate change as a plausible contributor to the rise in asthma. Greater concentrations of carbon dioxide and higher temperatures may increase pollen quantity, and induce longer pollen seasons. Pollen allergenicity can also increase as a result of these changes in climate. Exposure in early life to a more allergenic environment may also provoke the development of other atopic conditions, such as eczema and allergic rhinitis. Although the etiology of asthma is complex, the recent global rise in asthma could be an early health effect of anthropogenic climate change.